Name: Date:

Polynomial Factoring solution (version 665)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-72}}{2}$$

$$x = \frac{-12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 6\sqrt{2}\, i}{2}$$

$$x = -6 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 - 4i$ and $9 - 7i$ in standard form ($a + bi$).**

Solution

$$(6 - 4i) \cdot (9 - 7i)$$

$$54 - 42i - 36i + 28i^2$$

$$54 - 42i - 36i - 28$$

$$54 - 28 - 42i - 36i$$

$$26 - 78i$$

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3. **Write function $f(x) = x^3 - 5x^2 - 12x + 36$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	-5	-12	36
2		2	-6	-36
	1	-3	-18	0

$$f(x) = (x-2)(x^2 - 3x - 18)$$

$$f(x) = (x-2)(x-6)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+3)^2 \cdot (x-1) \cdot (x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.